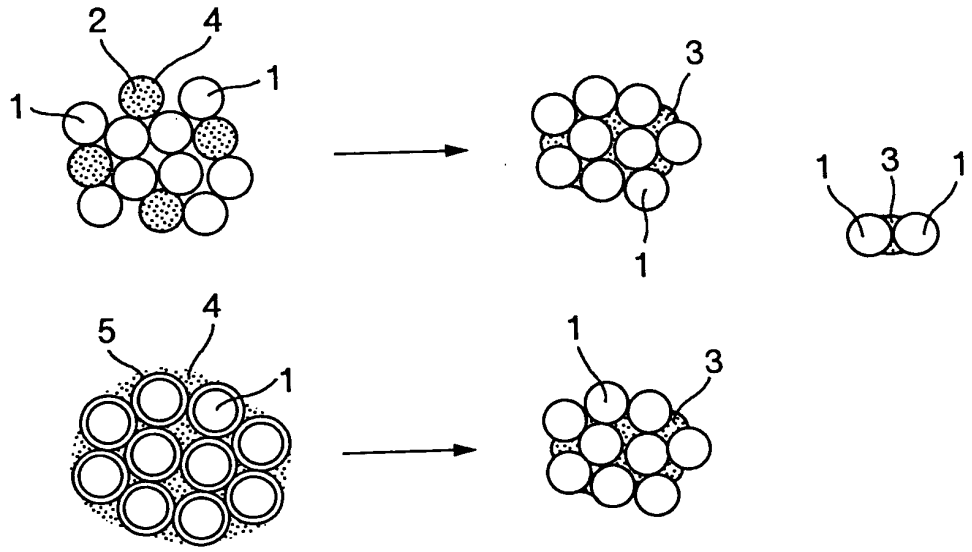
FIG.1



Pb-free - Solder

FIG.2

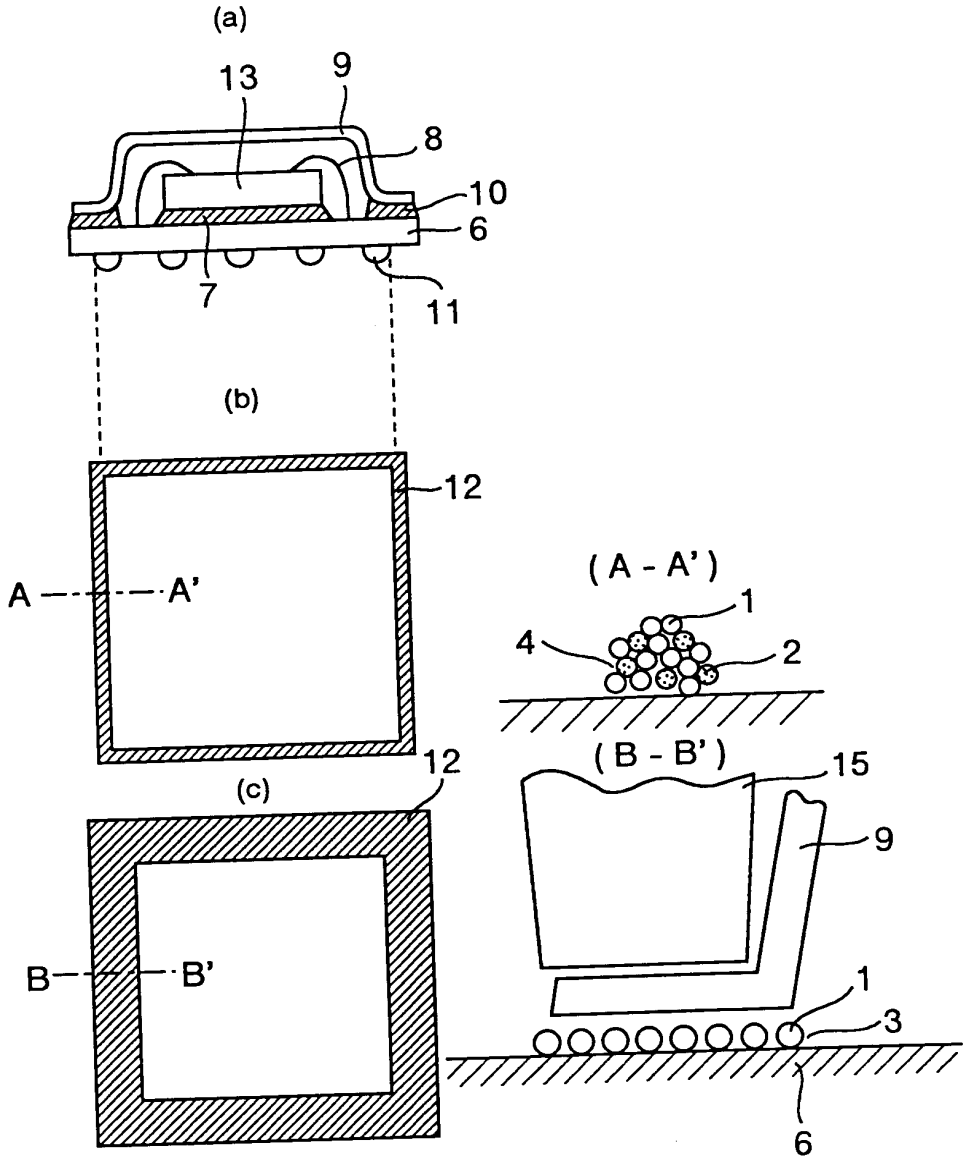


FIG.3

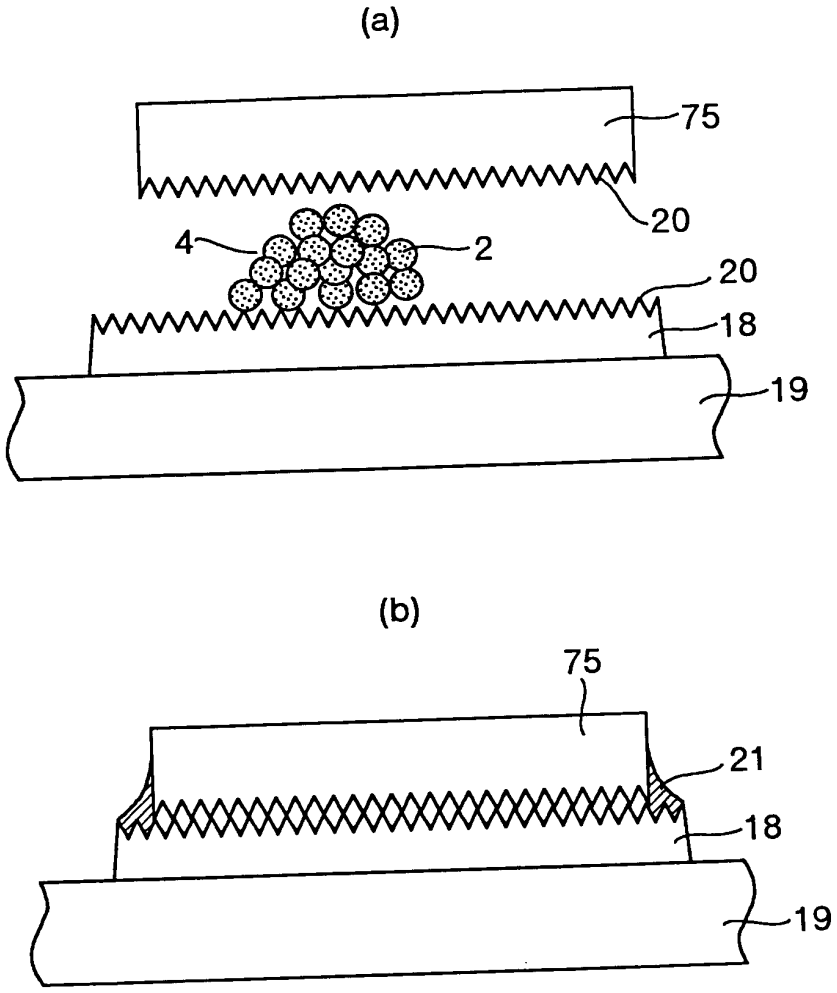


FIG.4

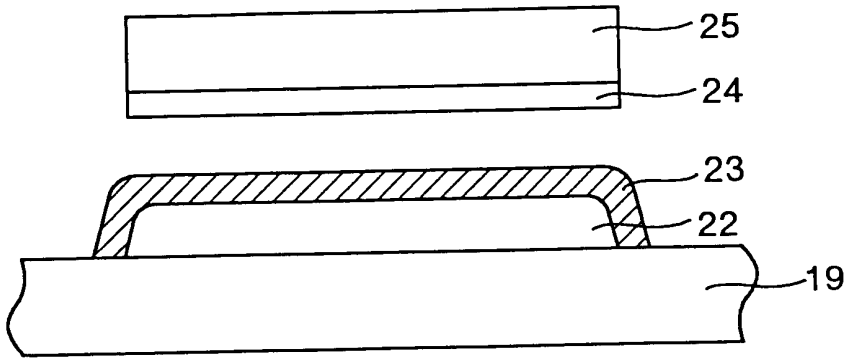
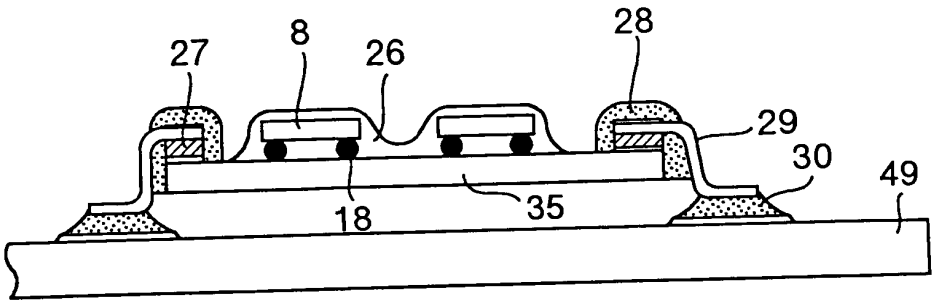
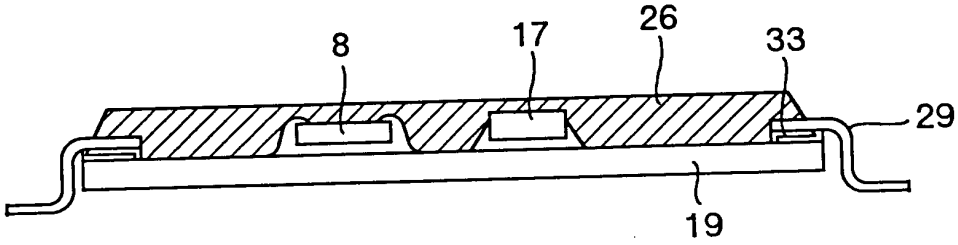


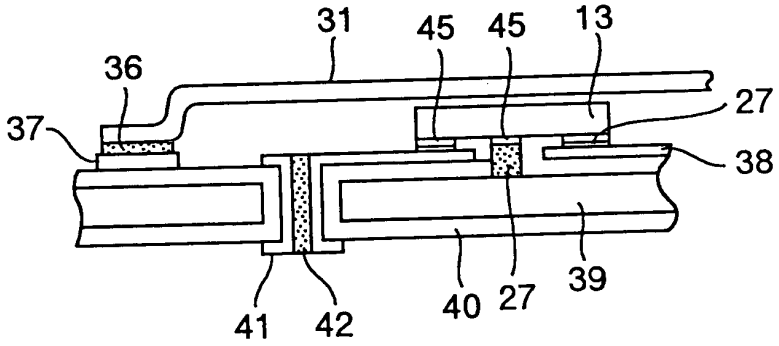
FIG.5


27
8
26
28
29
30
49
18
35

(a)


8
17
26
33
29
19

(b)


31
45
45
13
36
27
37
38
41
42
40
27
39

(c)

FIG.6

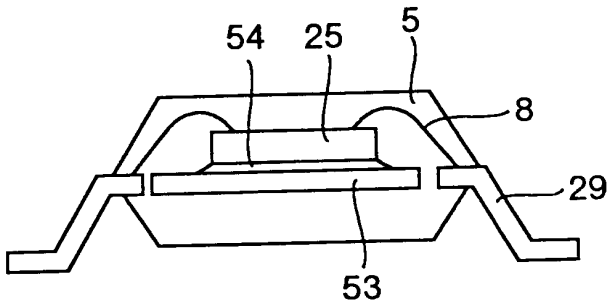
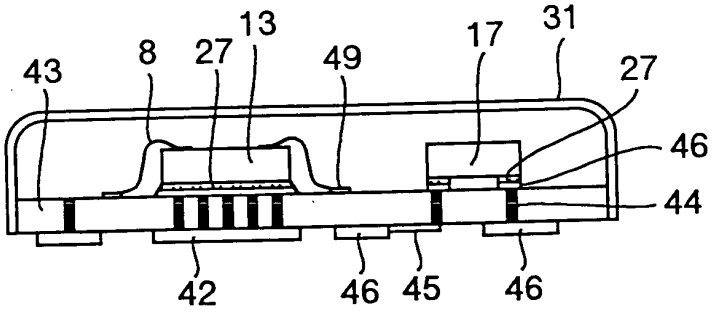


FIG.7


43
8
27
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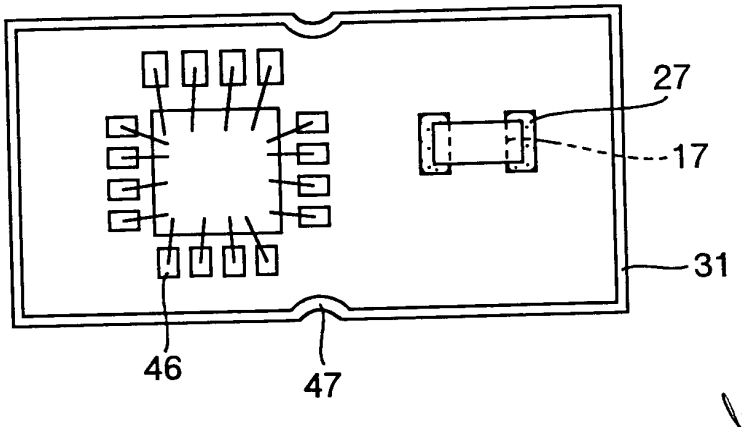
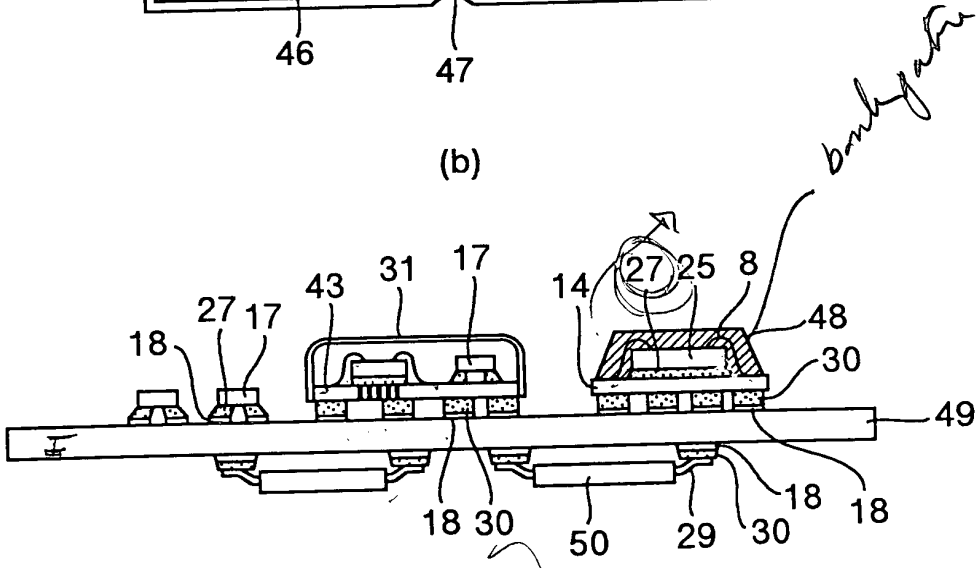
49
17
31
27
46
44
42
46
45
46

(a)

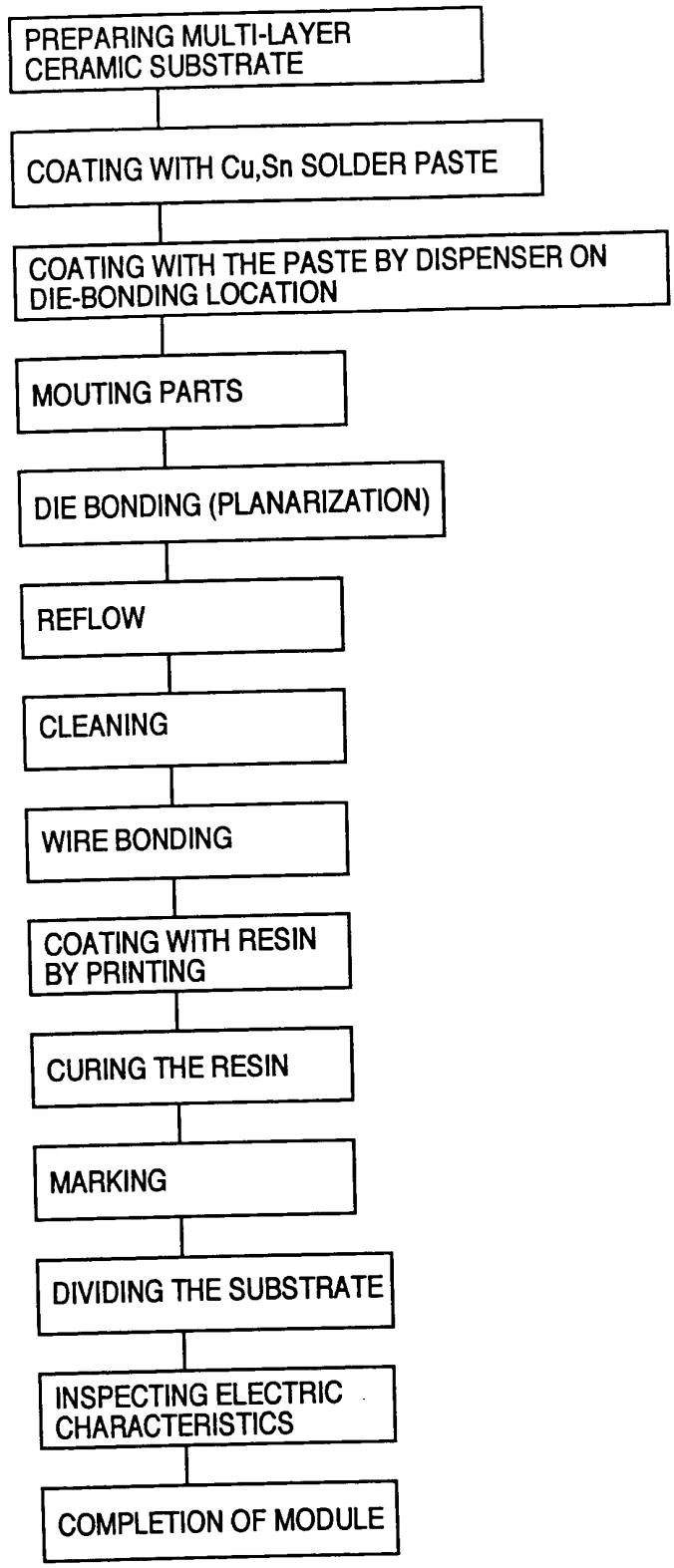

27
17
31
46
47

(b)

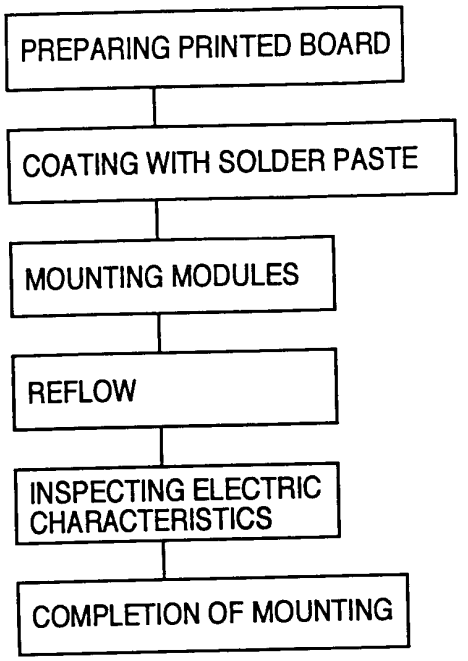

bump
43
31
17
27
25
8
14
27
17
18
48
30
49
18
30
50
29
30
18
18

(c)

FIG.8

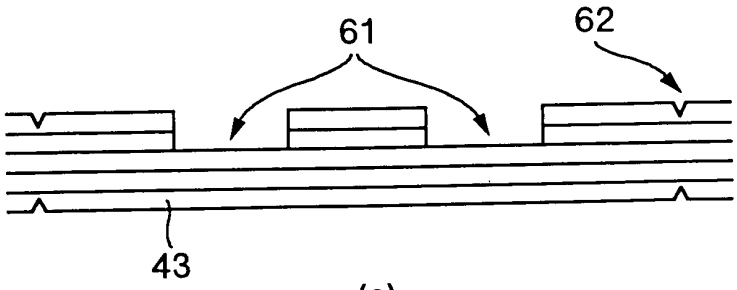


(a) STEPS OF ASSENBLING MODULE

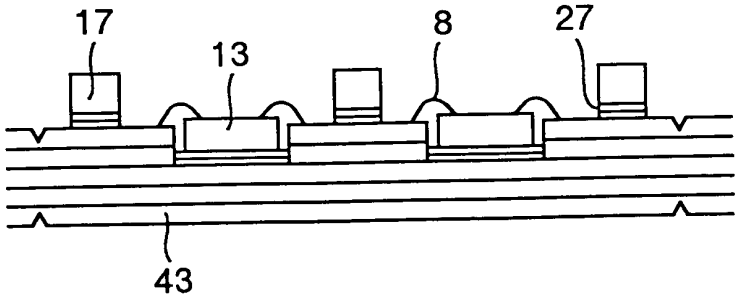


(b) STEPS OF SECONDARY MOUNTING AND ASSEMBLING OF MODULE

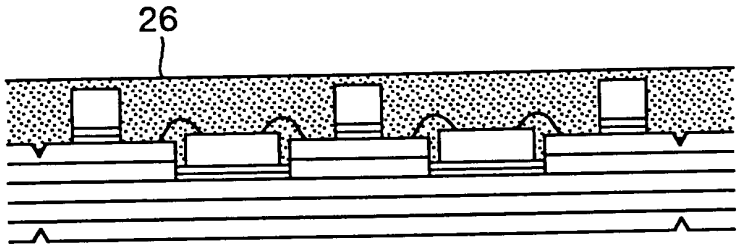
FIG.9



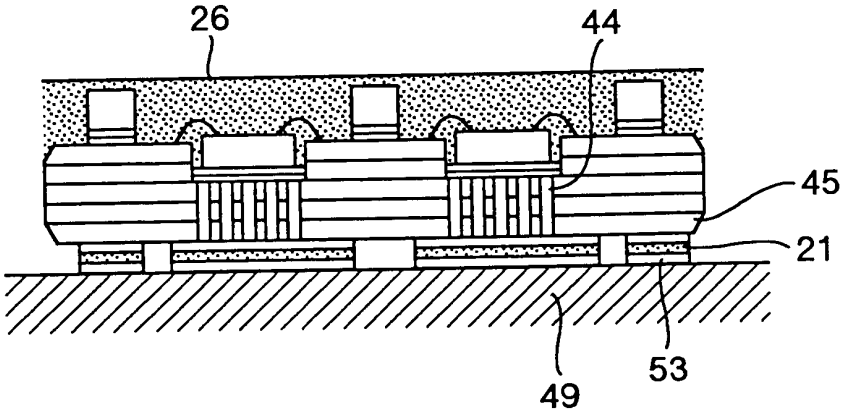
(a)



(b)



(c)



(d)

FIG.10

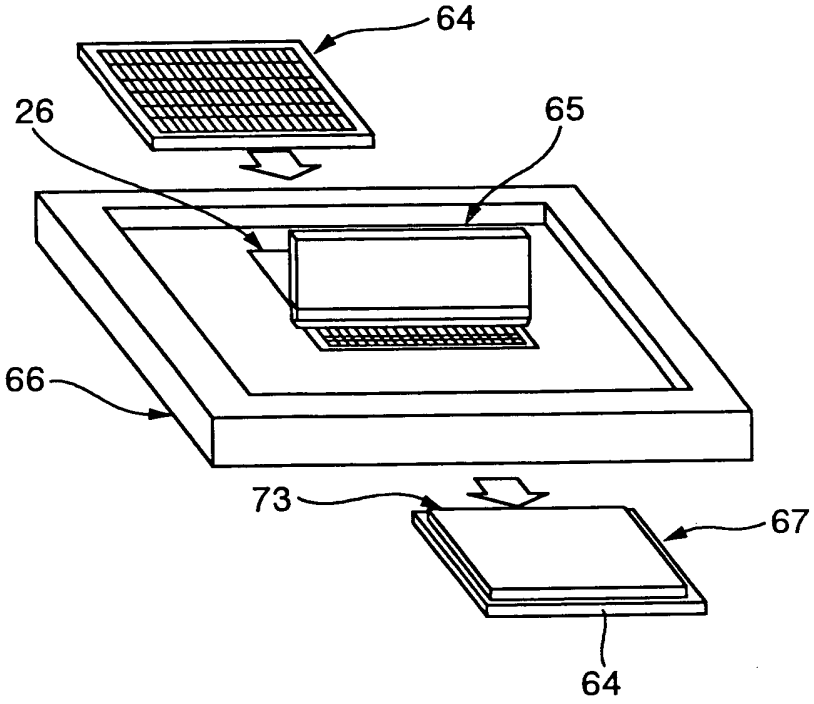


FIG.11

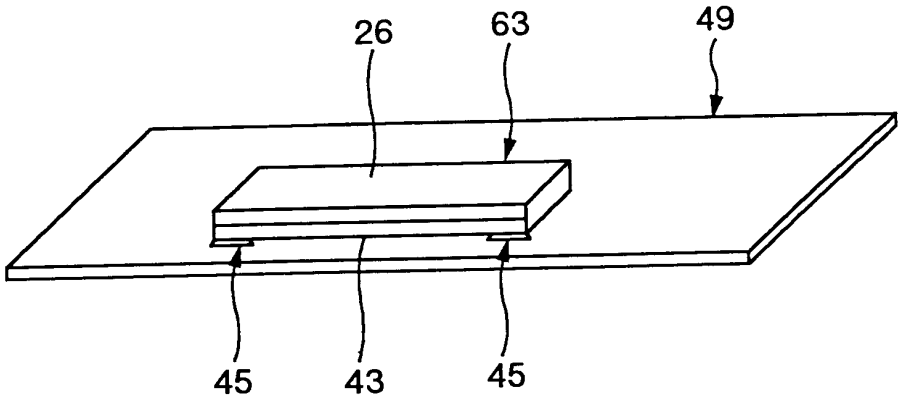
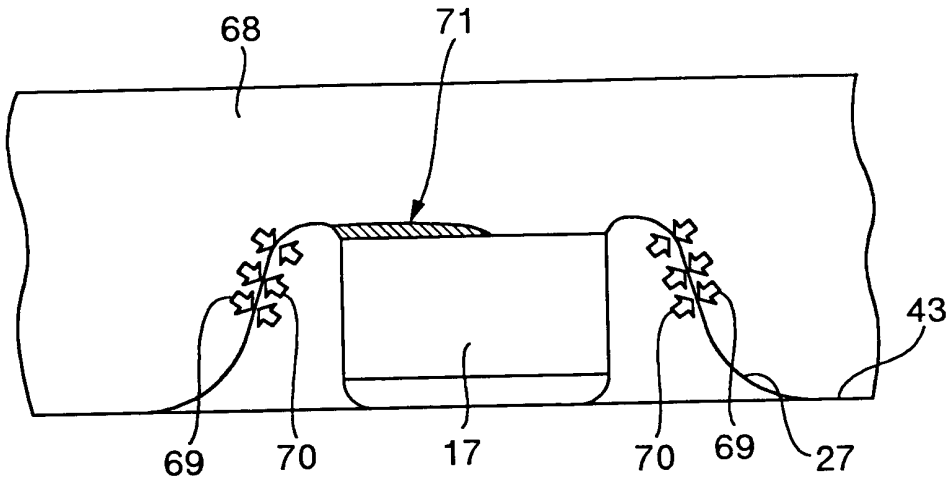
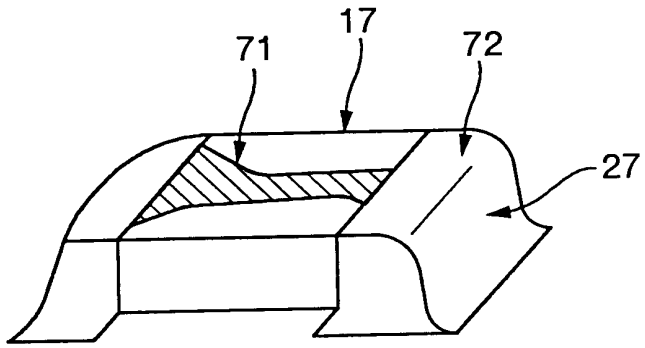


FIG.12



(a)



(b)

FIG.13

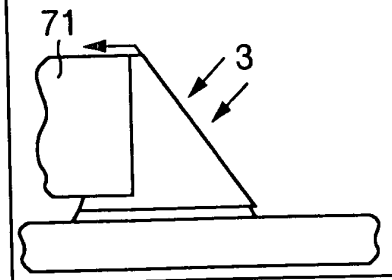
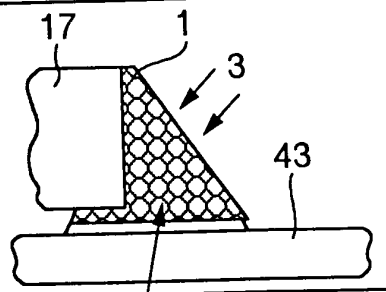
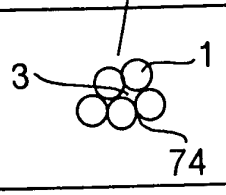
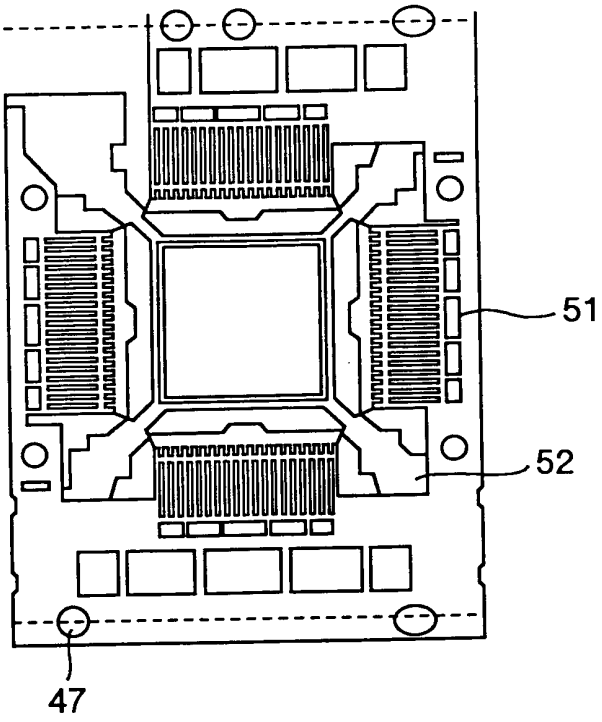
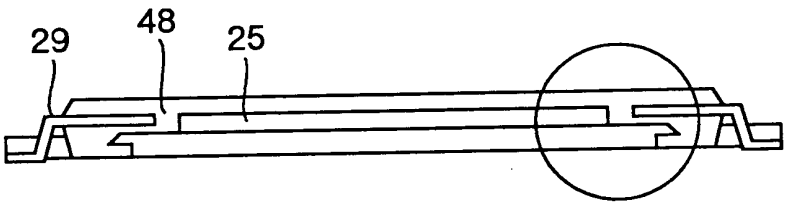
	VOLUME EXPANSION (%) (RATIO)	YOUNG'S MODULUS REQUIED IN RESIN	PHENOMENON	
CONVENTIONAL TECHNIQUE (PB BASED)	3 . 6 (2 . 6)	200 Mpa > at 180℃	CREEP DEFORMATION OF LIQUID (INCLUDING SOLID PHASE) AT THE TIME OF REMELTING	
THE INVENTION (Cu50/Sn50)	1 . 4 ※ (1)	500 Mpa > ※ at 180℃	JOINT IS EXPECTED THAT A BONDED PORTION DOES NOT MOVE BECAUSE Cu PARTICLS ARE FIXED TO EACH OTHER	
ASSUMPTION	※ 1/2 of THAT OF Sn	※ THE VALUE OF COMVENTIONAL TECHNIQUE ABOUT 2.5 TIMES		

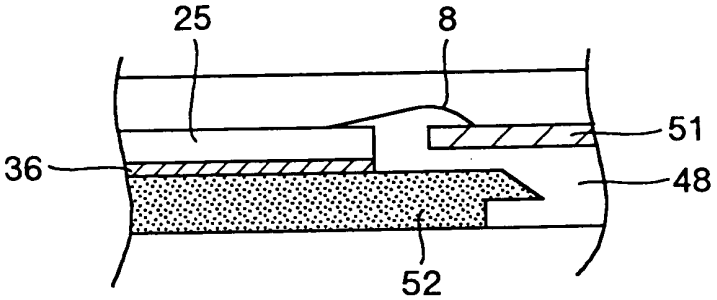
FIG.14



(a)



(b)



(c)

FIG.15

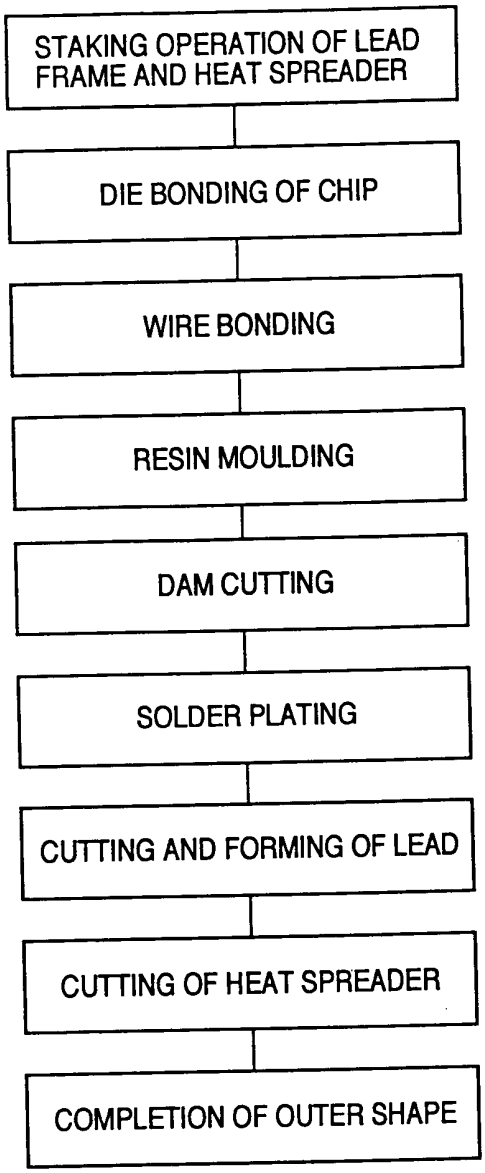

STAKING OPERATION OF LEAD FRAME AND HEAT SPREADER
DIE BONDING OF CHIP
WIRE BONDING
RESIN MOULDING
DAM CUTTING
SOLDER PLATING
CUTTING AND FORMING OF LEAD
CUTTING OF HEAT SPREADER
COMPLETION OF OUTER SHAPE

FIG.16

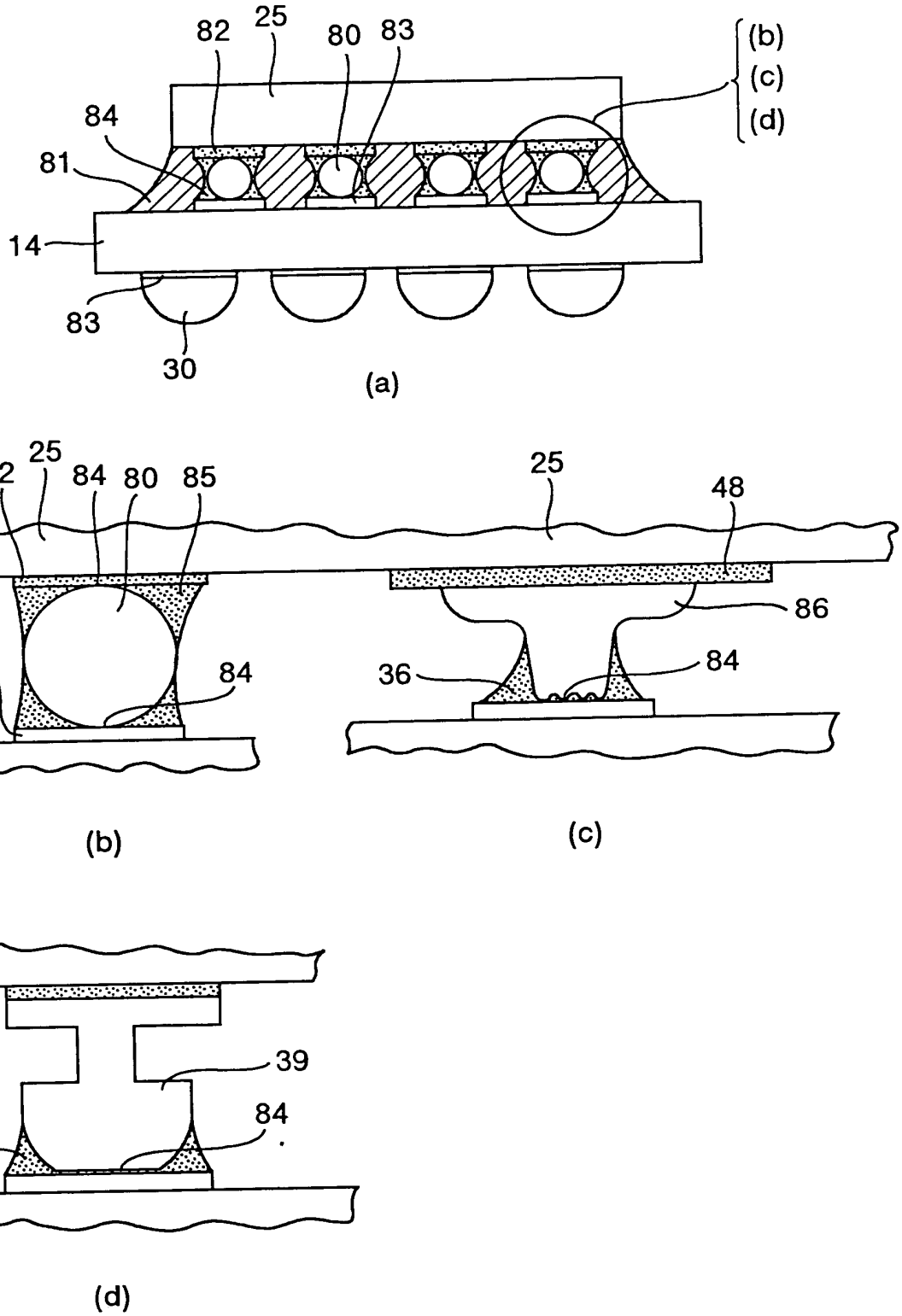
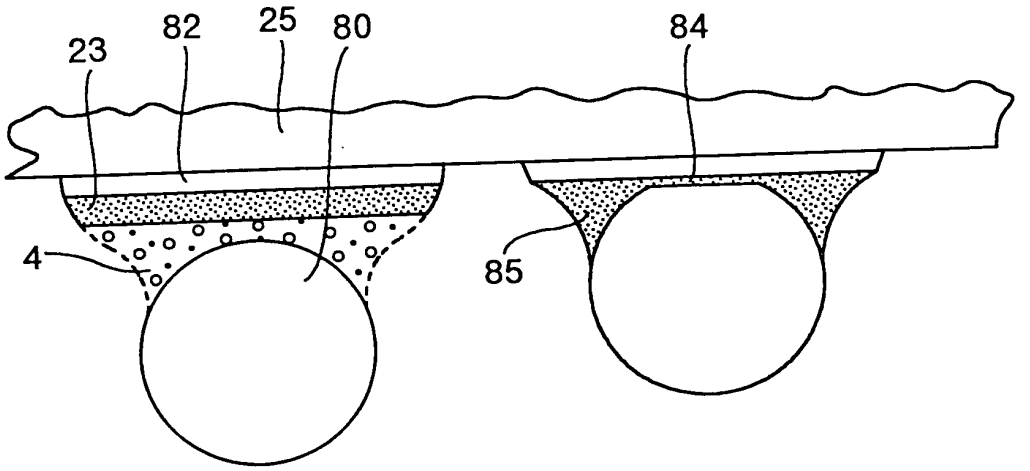
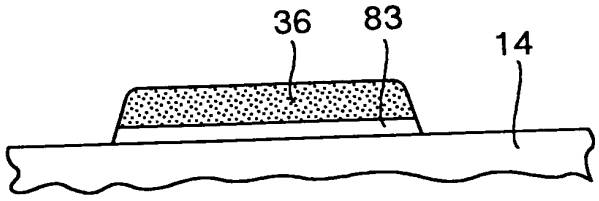

82
25
80
83
(b)
(c)
(d)
84
81
14
83
30
(a)
82
25
84
80
85
83
84
14
(b)
25
48
86
36
84
(c)
39
84
36
(d)

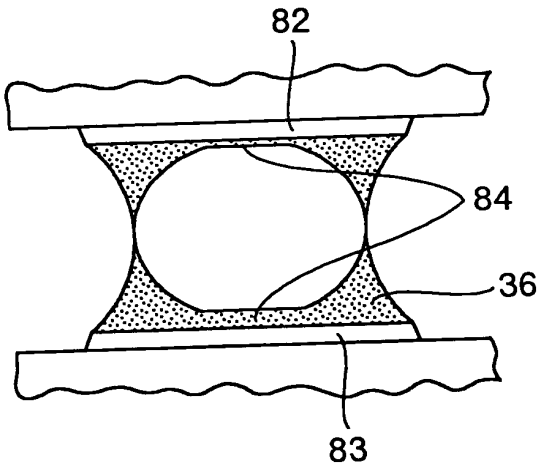
FIG.17



(a)

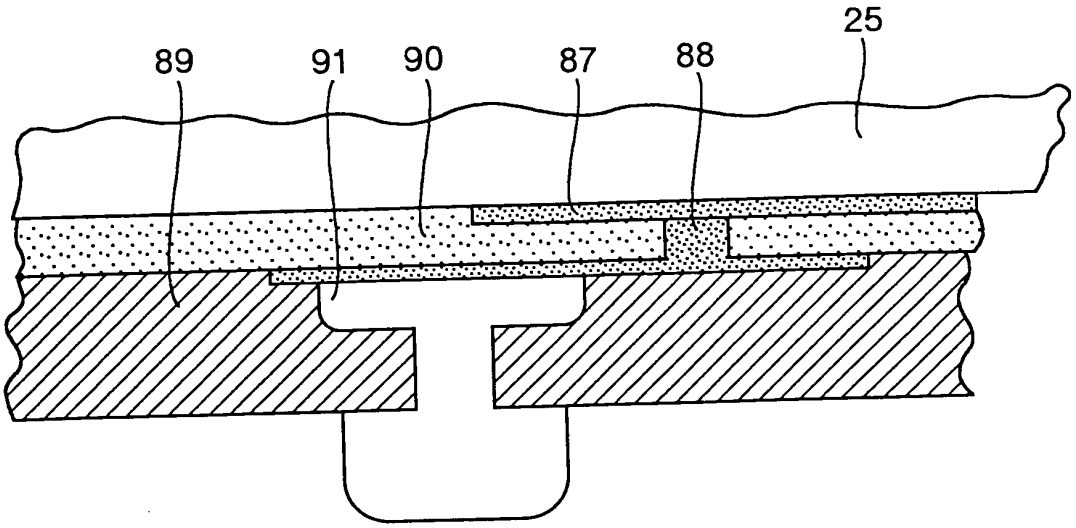


(b)

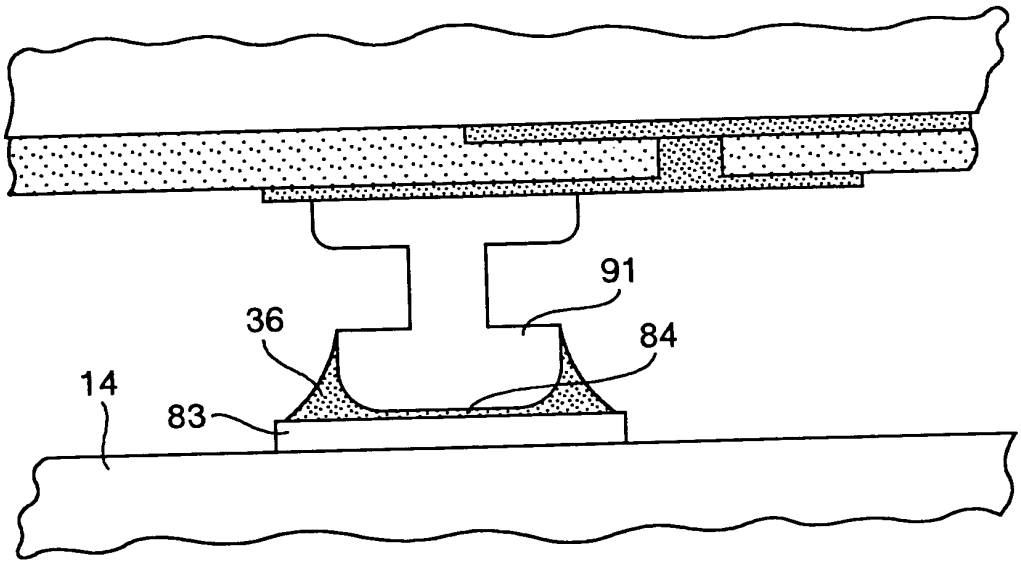


(c)

FIG.18



(a)



(b)

FIG.19

Sn / Cu	EVALUATION AND JUDGING	REASONS FOR JUDGING
10 / 4	×	↑
10 / 5	×	EXCESS OF Sn
10 / 7 (1.43)	△	PROPER RANGE
10 / 8 (1.25)	△~○	
10 / 10	○	PREFERRED RANGE
10 / 12.5 (0.8)	○	
10 / 15	△~○	
10 / 16.7 (0.6)	△	
10 / 25	×	SHORT OF Sn
10 / 50	×	↓
10 / 100	×	↓

CRITERION FOR JUDGING : ○ : PROPER
△ : ALMOST PROPER
× : SHORT (ON EXCESS) OF Sn